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2004/00082

# Sertifikaat

REPUBLIEK VAN SUID AFRIKA

PATENT KANTOOR  
DEPARTEMENT VAN HANDEL  
EN NYWERHEID



# Certificate

REPUBLIC OF SOUTH AFRICA

PATENT OFFICE  
DEPARTMENT OF TRADE AND  
INDUSTRY

Hiermee word gesertifiseer dat  
This is to certify that

2004/00082

the documents annexed hereto are true copies of:

Application forms P.1, P.2 and provisional specification and drawings of  
South African Patent Application No.2003/6624 as originally filed in the  
Republic of South Africa on 22 August 2003 in the name of JAN PETRUS  
HUMAN for an invention entitled: " MOULDING METHOD AND APPARATUS."

Geteken te

PRETORIA

Signed at

in die Republiek van Suid-Afrika, hierdie

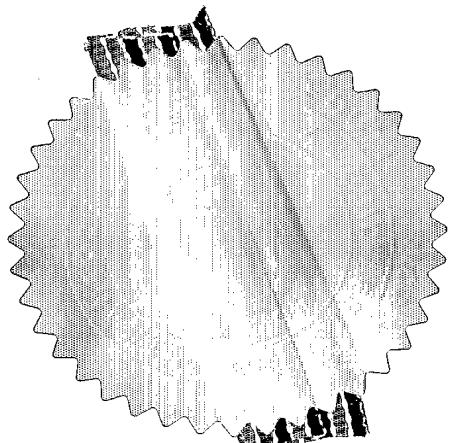
in the Republic of South Africa, this

dag van

December 2004

day of

1 S. ...  
Registrar of Patents



REPUBLIC OF SOUTH AFRICA

REGISTER OF PATENTS

OFFICIAL APPLICATION NO.		LODGING DATE: PROVISIONAL			ACCEPTANCE DATE	
22	010. 2003/6624	22	2003-08-22			
INTERNATIONAL CLASSIFICATION		LODGING DATE: COMPLETE			GRANT DATE	
51		23			47	
FULL NAME(S) OF APPLICANT(S) / PATENTEE(S)						
71	JAN PETRUS HUMAN					
APPLICANTS SUBSTITUTED						DATE REGISTERED
71						
ASSIGNEE(S)						DATE REGISTERED
71						
FULL NAME(S) OF INVENTOR(S)						
72	JAN PETRUS HUMAN					
PRIORITY CLAIMED		COUNTRY		NUMBER		DATE
		33	—	31	—	32
TITLE OF INVENTION						
54	MOULDING METHOD AND APPARATUS					
ADDRESS(ES) OF APPLICANT(S) / PATENTEE(S)		15 LOBELIA STREET, SOMERSET WEST, 7130, REPUBLIC OF SOUTH AFRICA				
ADDRESS FOR SERVICE		Brian Bacon & Associates 2 <sup>nd</sup> Floor Mariendahl House Norwich on Main Newlands 7700 Cape Town Western Cape			BB REF 10394	
74						
PATENT OF ADDITION TO NO.		DATE OF ANY CHANGE				
61						
FRESH APPLICATION BASED ON		DATE OF ANY CHANGE				

REPUBLIC OF SOUTH AFRICA  
PATENTS ACT, 1978

APPLICATION FOR A PATENT AND ACKNOWLEDGMENT OF RECEIPT  
(Section 30(1) Regulation 22)

FORM P.1

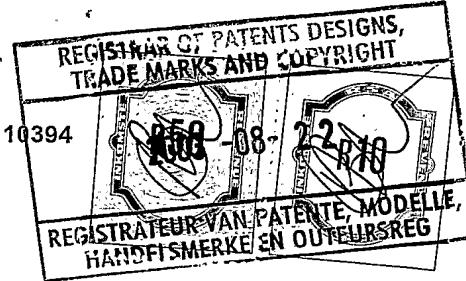
THE GRANT OF A PATENT IS HEREBY REQUESTED BY THE UNDERMENTIONED APPLICANT  
ON THE BASIS OF THE PRESENT APPLICATION FILED IN DUPLICATE

21 01 OFFICIAL APPLICATION NO. 2003/6624

BB REF: 10394

71 FULL NAME(S) OF APPLICANT(S)

JAN PETRUS HUMAN



ADDRESS(ES) OF APPLICANT(S)

15 LOBELIA STREET, SOMERSET WEST, 7130, REPUBLIC OF SOUTH AFRICA

54 TITLE OF INVENTION

MOULDING METHOD AND APPARATUS

THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2.  
(COUNTRY) (DATE) (NO.)

21 01 THE APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO

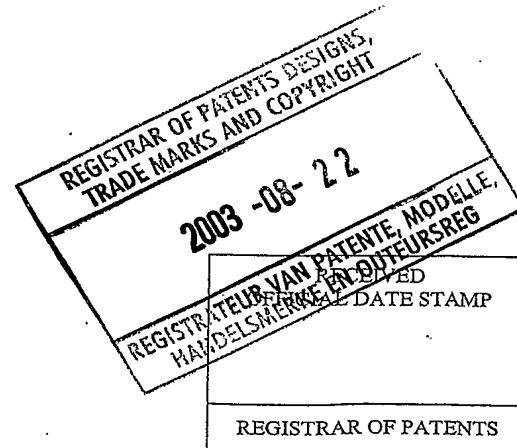
21 01 THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND BASED ON APPLICATION NO

THIS APPLICATION IS ACCCOMPANIED BY:

- 1. A single copy of a provisional or two copies of a complete specification of 8 pages
- 2. Drawings of 12 sheets
- 3. Publication particulars and abstract (Form P.8 in duplicate).
- 4. A copy of Figure of the drawings (if any) for the abstract.
- 5. An assignment of invention
- 6. Certified priority document(s). (State number)
- 7. Translation of the priority document(s)
- 8. An assignment of priority rights
- 9. A copy of Form P.2 and the specification of RSA Patent Application No
- 10. Form P.2 in duplicate
- 11. A declaration and power of attorney on Form P.3
- 12. Request for ante-dating on Form P.4
- 13. Request for classification on Form P.9
- 14.

74 ADDRESS FOR SERVICE: Brian Bacon & Associates  
2<sup>nd</sup> Floor Mariendahl House  
Norwich on Main  
Newlands 7700  
Cape Town Western Cape

DATED THIS 21<sup>st</sup> DAY OF August 2003



  
BRIAN BACON & ASSOCIATES  
APPLICANTS PATENT ATTORNEYS  
The duplicate will be returned to the applicant's address for service as  
proof of lodgment but is not valid unless endorsed with official stamp

**DECLARATION AND POWER OF ATTORNEY**

(Section 30 – Regulation 8, 22(i)(c) and 33)

PATENT APPLICATION NO	
21	01
2003/6626	

BB REF:10394

LODGING DATE	
22	2003-08-22

FULL NAME(S) OF APPLICANT(S)	
71	JAN PETRUS HUMAN

FULL NAME(S) OF INVENTOR(S)	
72	JAN PETRUS HUMAN

PRIORITY CLAIMED	COUNTRY	NUMBER	DATE
	33	31	—
32	—	—	—

NOTE: The country must be indicated by its International Abbreviation – see schedule 4 of the Regulations

TITLE OF INVENTION	
54	MOULDING METHOD AND APPARATUS

\* I/We JAN PETRUS HUMAN

hereby declare that:-

1. I/We am/are the applicant(s) mentioned above;
- \*\* 2. I/We have been authorised by the applicant(s) to make this declaration and have knowledge of the facts herein stated in the capacity of the applicant(s);
- \*\*\* 3. the inventors(s) of the abovementioned invention is/are the person(s) named above and the applicant(s) has/have acquired the right to apply by virtue of an assignment from the inventor(s);
4. to the best of my/our knowledge and belief, if a patent is granted on the application, there will be no lawful ground for the revocation of the patent;
- \*\*\*\* 5. this is a convention application and the earliest application from which priority is claimed as set out above is the first application in a convention country in respect of the invention claimed in any of the claims; and
6. the partners and qualified staff of the firm **BRIAN BACON & ASSOCIATES**, patent attorneys, are authorised, jointly and severally, with powers of substitution and revocation, to represent the applicant(s) in this application and to be the address of service of the applicant(s) while the application is pending and after a patent has been granted on the application.

SIGNED THIS 21<sup>st</sup> DAY OF August 2003



(no legalization necessary)

- \* In the case of application in the name of a company, partnership or firm, give full names of signatory/signatories, delete paragraph 1, and enter the capacity of each signatory in paragraph 2.
- \*\* If the applicant is a natural person, delete paragraph 2.
- \*\*\* If the right to apply is not by virtue of an assignment from the inventor(s), delete "an assignment from the inventor(s)" and give details of acquisition of right.
- \*\*\*\* For non-convention applications, delete paragraph 5.

REPUBLIC OF SOUTH AFRICA  
Patents Act, 1978**PROVISIONAL SPECIFICATION**  
(Section 30 (1) – Regulation 27)

21	01	OFFICIAL APPLICATION NO
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22	LODGING DATE
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... 2003 / 6624

2003 -08- 22

71	FULL NAME(S) OF APPLICANT(S)
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JAN PETRUS HUMAN

72	FULL NAME(S) OF INVENTOR(S)
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JAN PETRUS HUMAN

54	TITLE OF INVENTION
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MOULDING METHOD AND APPARATUS

FIELD OF THE INVENTION

THIS INVENTION relates to moulding apparatus and to a method of moulding. It also relates to a cap for a container.

BACKGROUND TO THE INVENTION

5 There is a great need for a foolproof tamper evident cap for containers which, if removed and refitted, exhibits damage which reveals that tampering has taken place. Caps which are used extensively at this time can be removed and refitted without there being any visible evidence that tampering has occurred.

0 The present invention seeks to provide a tamper evident cap, moulding apparatus and a method of moulding, the method and apparatus being specifically, but not exclusively, for moulding the tamper evident cap.

BRIEF DESCRIPTION OF THE INVENTION

According to one aspect of the present invention there is provided a moulding apparatus including a female mould structure and a male mould, the  
5 female mould structure having a cavity therein and including a female mould and a fixed shaft which enters said cavity through a bore which leads into said cavity, said female mould being free to reciprocate with respect to said shaft, the male mould including a spigot which, when in the female mould defines, with surfaces of the female mould and an end surface of said shaft, a mould cavity having the shape of

the article to be produced.

According to a further aspect of the present invention there is provided a method of moulding which comprises feeding a charge of mouldable material into the cavity of a female mould structure comprising a fixed shaft and a reciprocable female mould, closing said cavity by inserting the spigot of a male mould into said cavity, and displacing said male mould and said female mould with respect to said shaft so that the shaft slides into said cavity, said spigot, an end surface of said shaft and surfaces of the female mould defining a mould cavity having the shape of the article to be produced.

0 Said spigot can have thereon a protruding rib which extends along the spigot at that end of the spigot which is last to enter the cavity, said rib contacting the female mould whereby a slit is moulded into said article. In an alternative form said rib is carried by the female mould and contacts said spigot when the spigot is in the female mould.

5 A plurality of ribs spaced apart circumferentially can be provided thereby to mould an array of slits.

A number of male moulds and female mould structures can be on rotatable carousels.

According to another aspect of the present invention there is provided

a cap comprising a skirt, a transverse end wall at one end of the skirt, and a band at the other end of the skirt, the band being connected to the skirt by a plurality of bridges, the inner diameter of the band and the outer diameter of the skirt being such that the skirt can be forced into the band, the portion of the skirt that enters the band having slits therein which are open at the free edge of the skirt.

The present invention also provides a method of capping a container which comprises pressing a cap as defined above onto the neck of the container so that the bridges break and the skirt slides into the band, the band causing said slits to close-up whereby protruding formations on the inside of the band interlock with a protruding formation on the container to prevent the cap being removed without breaking the band.

The band can have a line of weakness so that it breaks upon pressure being applied thereto sufficient to slide it off the skirt.

#### BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:-

Figure 1 is an isometric view of moulding apparatus comprising a female mould structure and a male mould;

Figure 2 is a diagrammatic side elevation, partly in section, of the moulding

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apparatus of Figure 1;

Figures 3 and 4 show the moulding apparatus at the beginning of the closing cycle and at the end of the closing cycle;

Figure 5 is a pictorial view showing the moulding apparatus in its open condition and fitted to a carousel;

Figure 6 is a pictorial view similar to Figure 5 but showing the moulding apparatus closed;

Figure 7 is a pictorial view of a bottle cap from the closed end;

Figure 8 is a pictorial view of the cap of Figure 7 from the open end;

Figure 9 is a section through the cap of Figures 7 and 8;

Figure 10 illustrates the moulding apparatus which produces the cap of Figures 7 to 9;

Figure 11 is a pictorial view looking into the female mould; and

Figure 12 illustrates the production of a preform.

#### DETAILED DESCRIPTION OF THE DRAWINGS

Referring firstly to Figures 1 and 2, the moulding apparatus 10 comprises a male mould 12 and a female mould structure 14 comprising a movable female mould 16 and a fixed shaft 18.

The male mould 12 is stepped to provide closure surfaces 20, 22 which bear on closure surfaces 24, 26 of the female mould 16. The male mould further includes a spigot 28.

The female mould 16 has a stepped bore 30 through it. The lower part 30.1 of the bore 30 receives the shaft 18. An intermediate part 30.2 of the bore 30 forms the external boundary of a mould cavity 32 (see Figure 4) having the shape of the product to be moulded. In this form the product is a cap for a bottle.

5 The shaft 18 has a stop ring 34 around it close to its lower end and the lower end of the shaft 18 is fixed to a plate 36. A spring 38 between the female mould 16 and the plate 36 pushes the mould 16 upwards.

0 At the beginning of a moulding cycle, the male and female moulds are separated as shown in Figures 1 and 2. This enables a measured charge C (see Figure 3) of synthetic plastics material to be dropped into the female mould structure so that it lies on the upper end of the shaft 18.

5 The male mould 12 moves downwardly into contact with the female mould 16 which at this time is held in its uppermost position (Figure 2) by the spring 38. The upper end of the mould cavity 32 is sealed-off and the male mould 12 continues to move down forcing the female mould 16 to slide down with respect to the fixed shaft 18 against the action of the spring 38. Such movement continues until the lower face of the mould 16 abuts the ring 34. The mould structure is now as shown in Figure 4.

0 Figures 5 and 6 illustrate that the female mould structure 14 can be mounted on a rotatable ring 40 which carries a series of female mould structures 14.

The male moulds 12 are also mounted on a ring (not shown).

Referring now to Figures 7 to 9, the cap 42 comprises a skirt 44 and a transverse end wall 46. On the inside of the skirt 44 there is a raised thread (not shown) which is produced by a corresponding spiral groove in the spigot 28 of the male mould 12. Locking tabs 48 protrude inwardly from the skirt. These co-operate with a bead on the bottle. As the cap is removed, the tabs are forced outward by the bead, and this increases the overall diameter of the cap on this circumference. The skirt 44 also has slits 50 in it which extend axially of the skirt 44 from its free edge and the cap further comprises a band 52 which is joined to the skirt by way of a series of bridges 54 (see Figure 9).

The tool for moulding the cap of Figures 7 to 9 is shown in more detail in Figures 10 and 11. The spigot 28 is formed with a plurality of ribs 56 where the cylindrical side surface of the spigot meets the closure surface 20. These occupy spaces which would otherwise be occupied by material forming the skirt. Thus the presence of the ribs 56 results in the skirt being moulded with the slits 50.

The surfaces designated 58 and 60 form the inner and outer boundaries of the annular space in which the band 52 is moulded.

As described above the band 52 is connected to the skirt by bridges. These bridges are moulded in the gaps designated 62 in Figure 11.

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The band 52 can be moulded with an internal rib 64 (Figure 9) which interlocks with a groove (not shown) in the outer surface of the skirt 44 to interlock the band and skirt.

It is also possible in accordance with the invention to mould the band 5 on the inside of the cap, the bridges breaking and the cap sliding over the band during the capping procedure. In this form the cap has lines of weakening so that, on removal, a portion of the cap is broken off to reveal tampering.

In Figure 12 a mould is disclosed in which a preform P can be manufactured and which is later blown to form a bottle or other container. Like parts 0 have been designated with the same references as used in Figure 1 with the addition of the suffix .1. The only significant difference between the mould of Figure 1, and the mould of Figure 12 resides in the shape of the mould cavity.

Dated this 21<sup>st</sup> day of August 2003

5 Brian Bacon & Associates  
Applicant's Patent Attorney

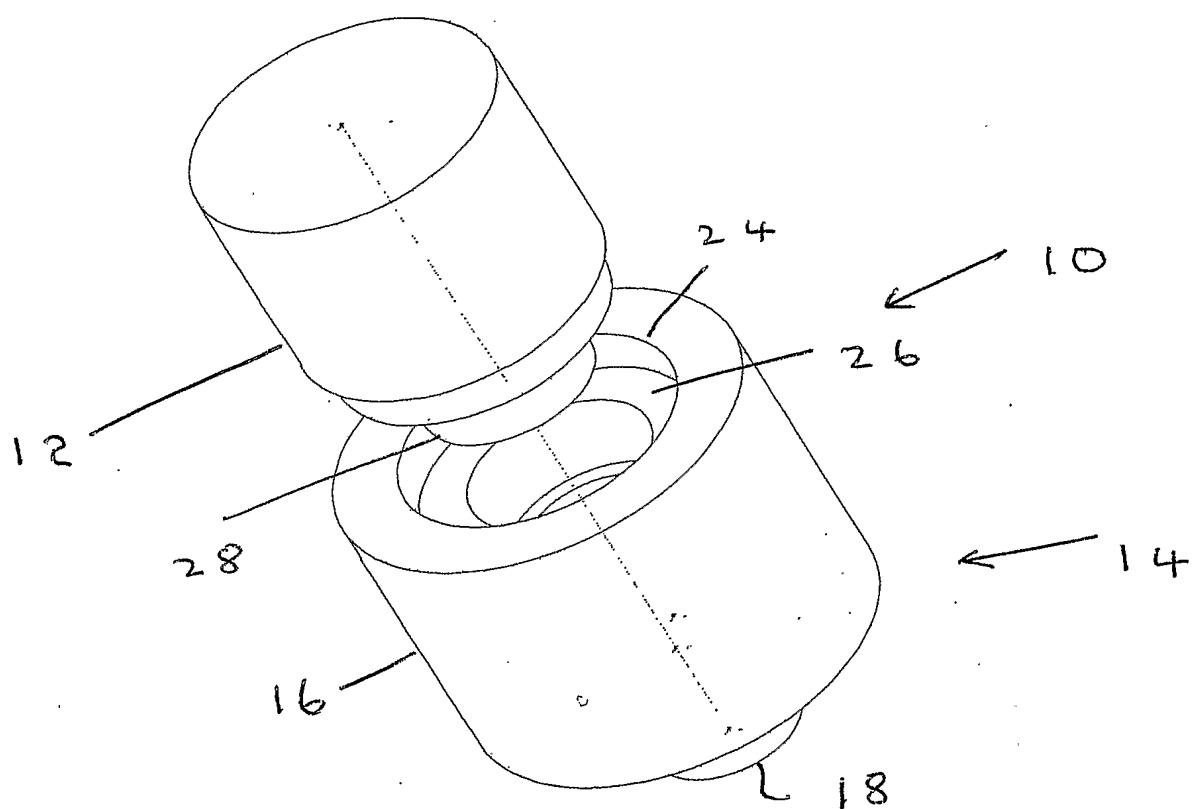
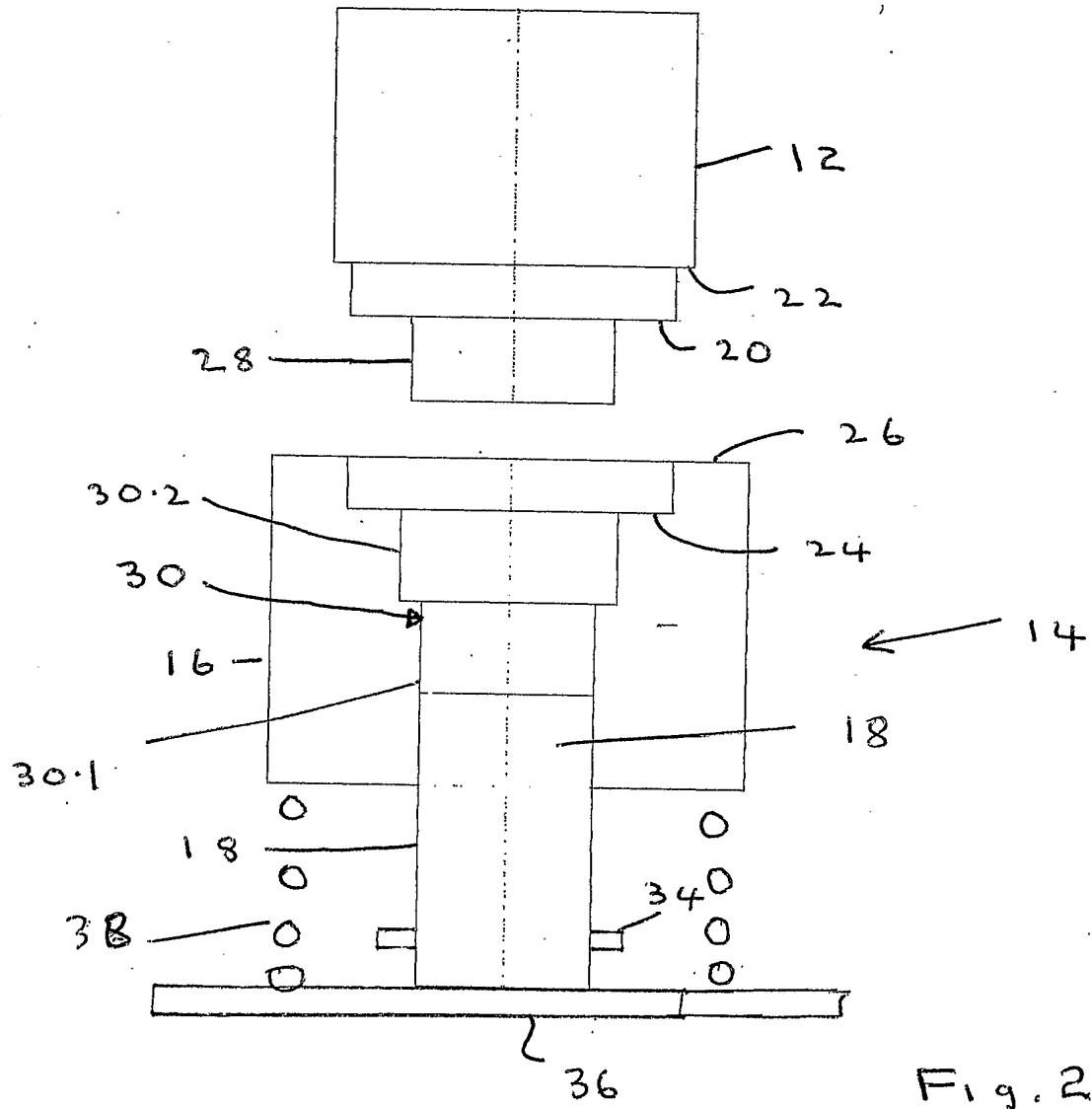


Fig.1



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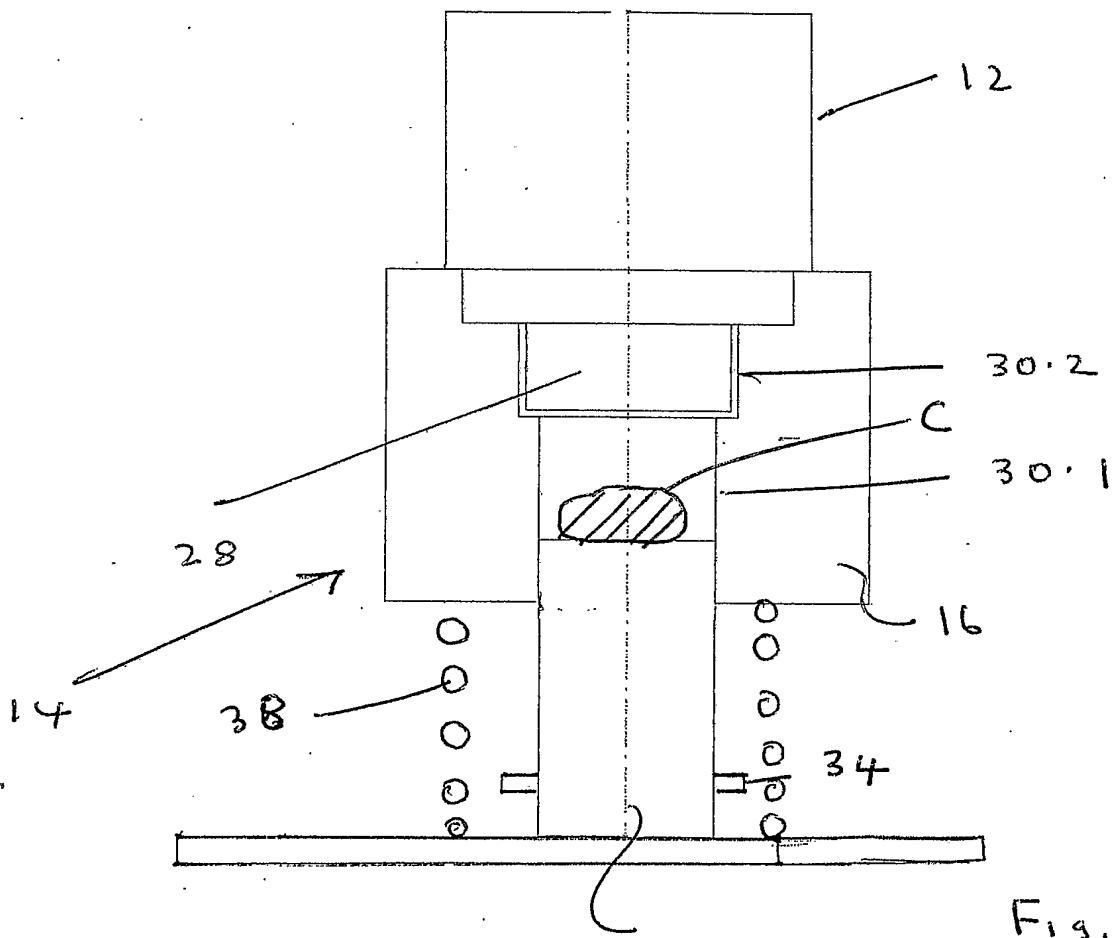


Fig. 3

18

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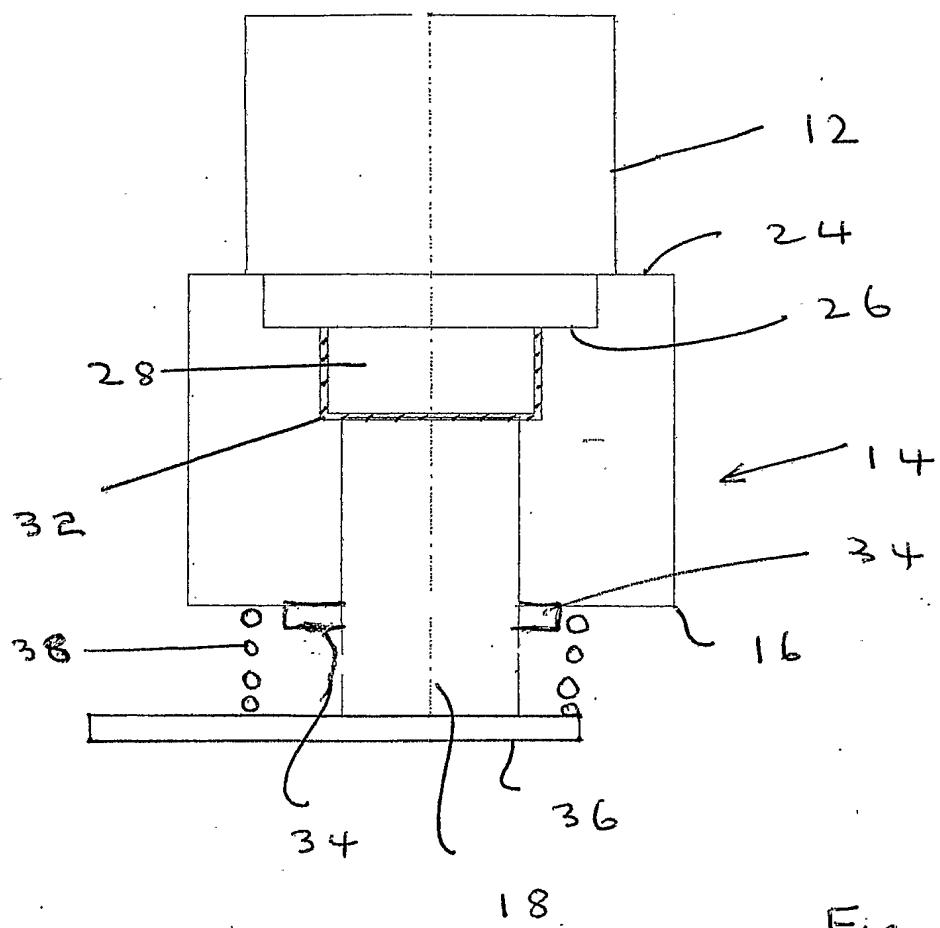
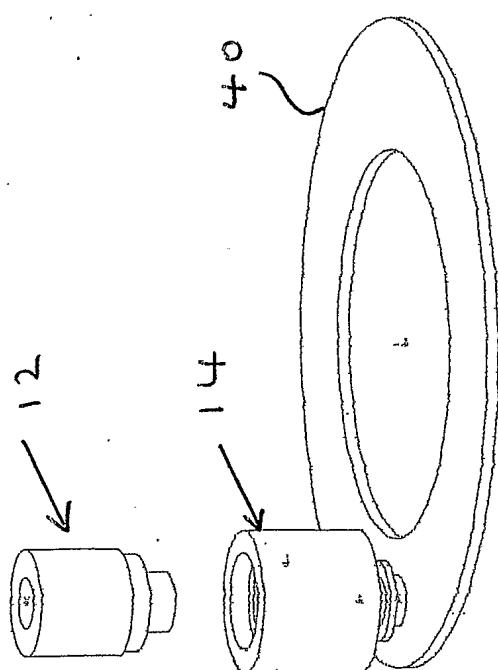
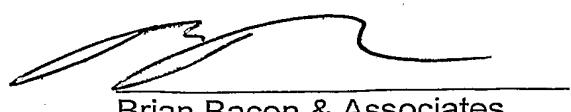


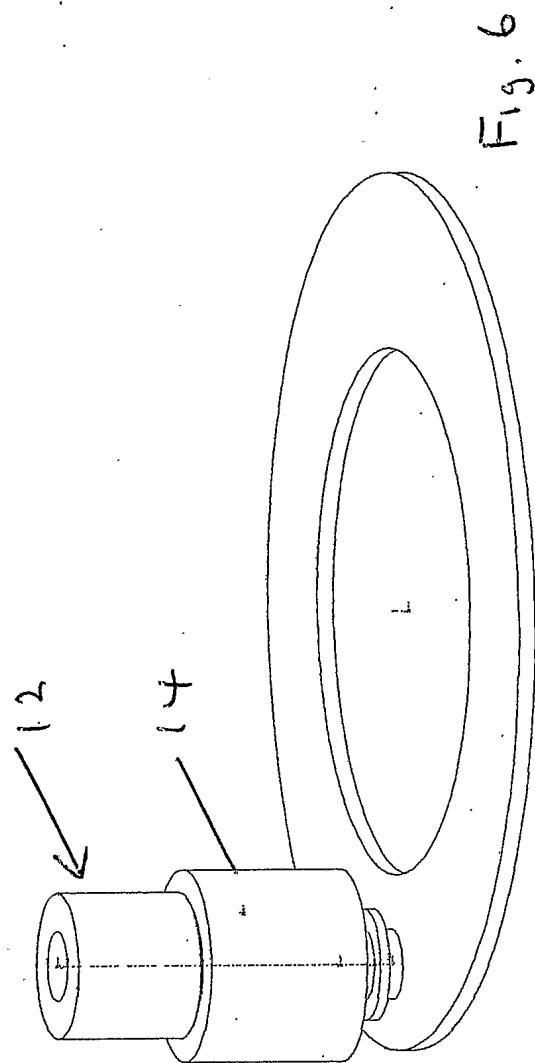
Fig. 4

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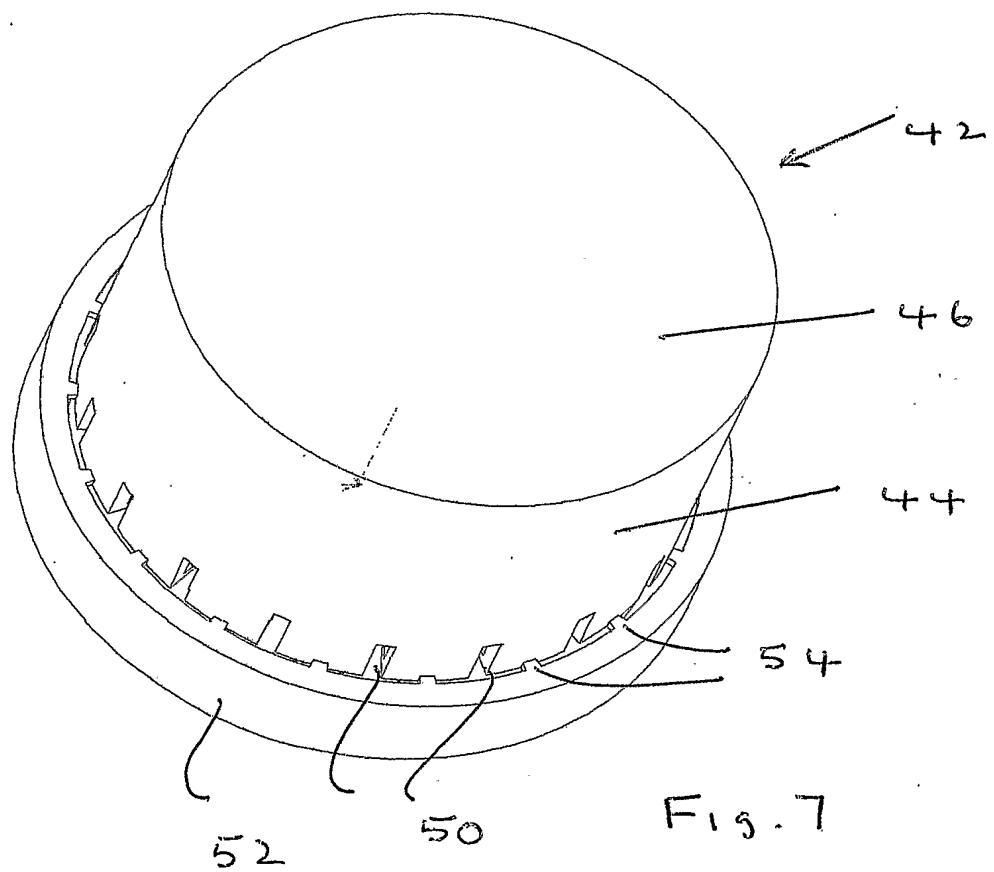
Fig. 5

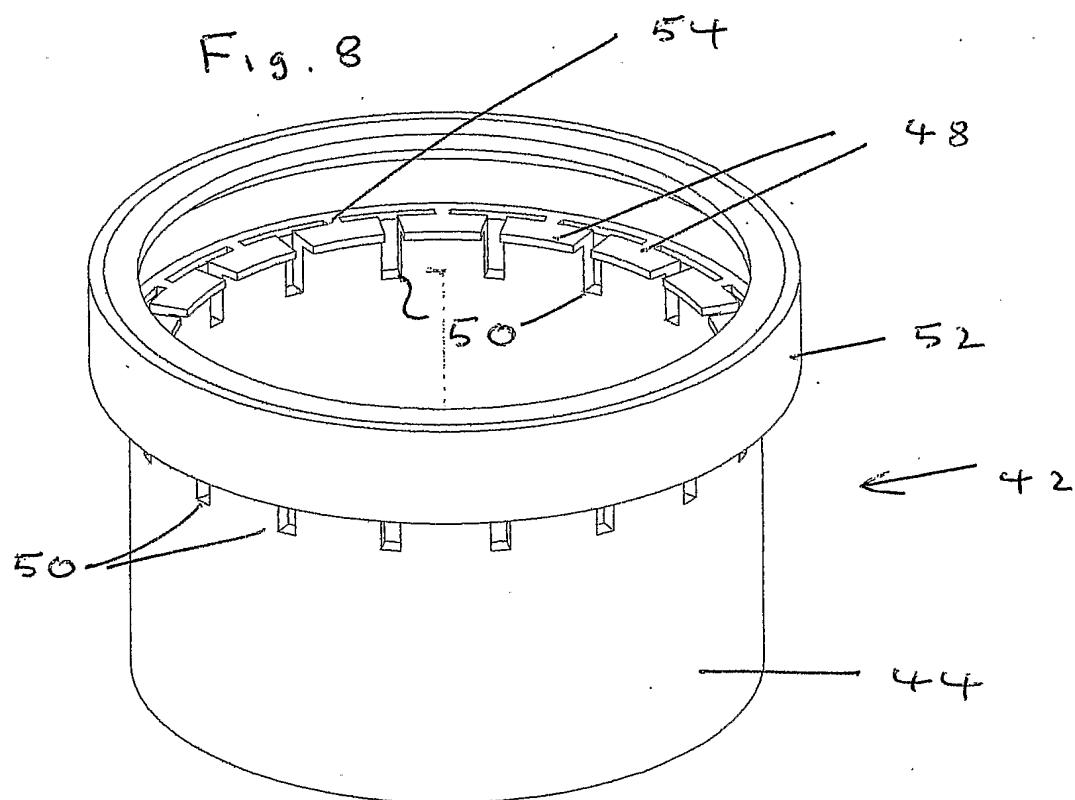


  
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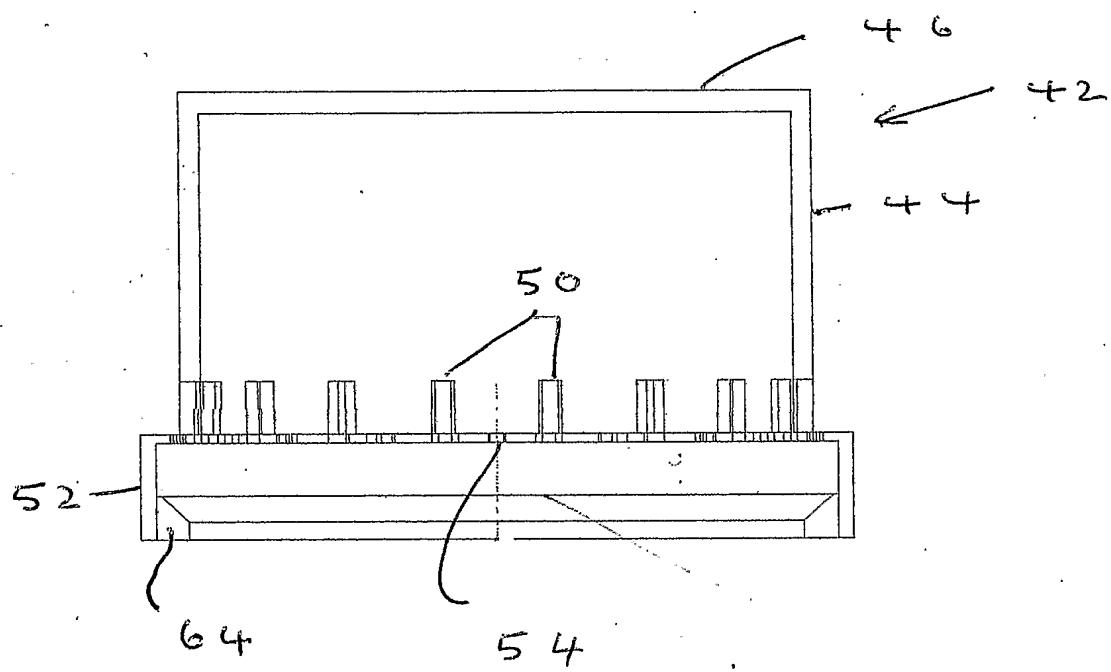


Fig. 9



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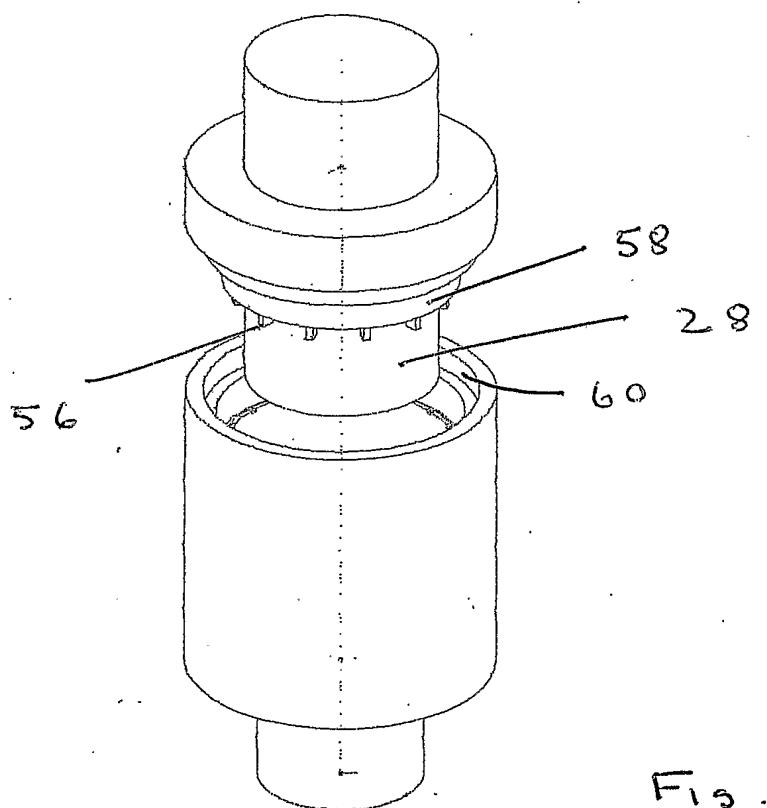


Fig. 10

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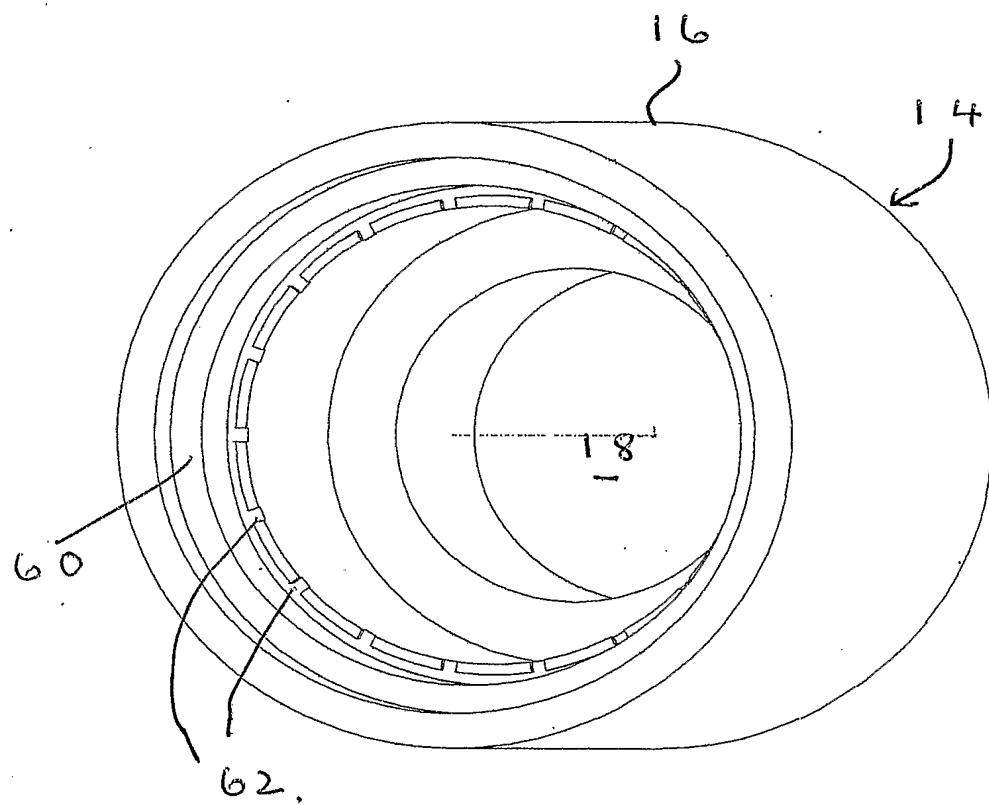


Fig. 11

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12 Sheets  
Sheet No.12

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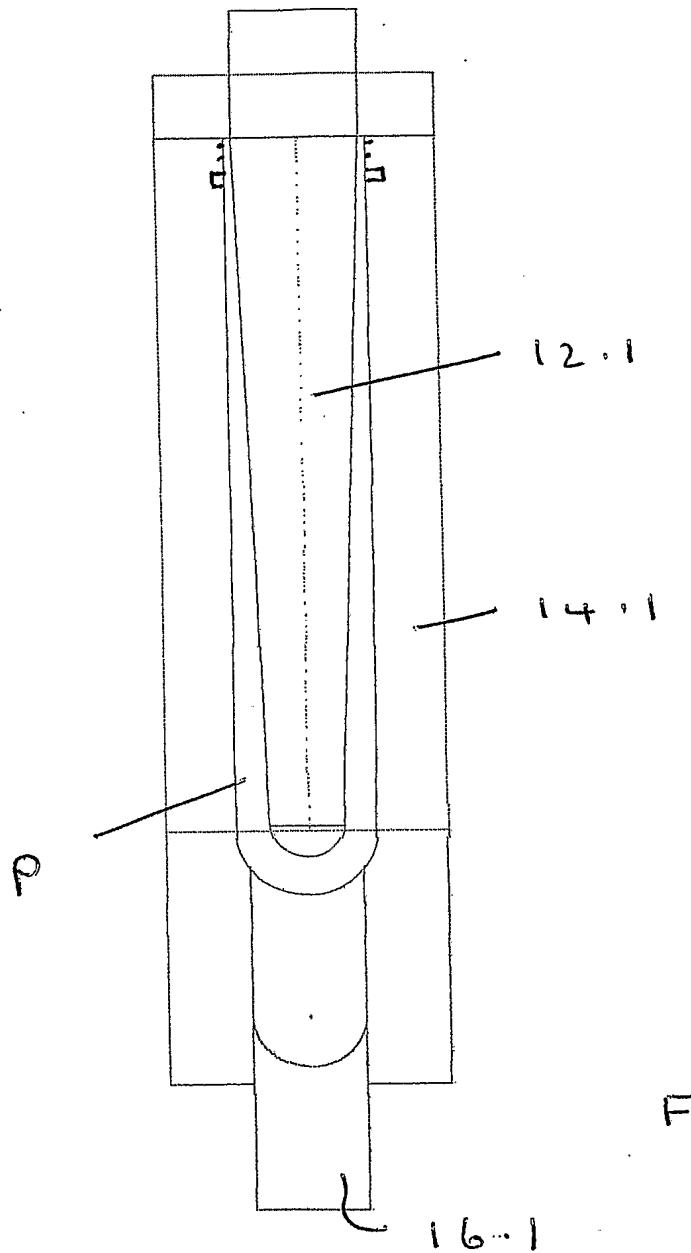
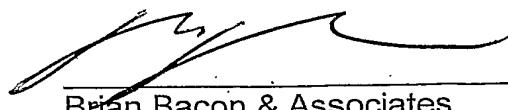


Fig. 12

  
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